

REMARKS

Pending Claims

Claims 1 and 3-56 are pending in this application. Claims 1 and 30 have been amended herein to overcome the rejection of claims 1-56 under 35 U.S.C. § 112, second paragraph. Each of the claims prior to amendment stands rejected under 35 U.S.C. § 103(a). Reconsideration of the rejections in view of the amendments and remarks herein is respectfully requested.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The Office Action rejects claims 1-56 under 35 U.S.C. § 112, second paragraph, as vague and indefinite. Claims 1 and 30 have been amended as suggested by the Examiner in order to overcome these rejections.

Rejections Under 35 U.S.C. § 103(a)

The Office Action rejects claims 1-18 and 48-56 as obvious over Schiele and Flory in view of Titus, and claims 19-47 further in view of one or more of the Gerteis references. More specifically, claims 19-25 were rejected as obvious over Schiele and Flory in view of Titus, and further in view of U.S. Patent 5,169,525 to Gerteis, over Schiele and Flory in view of Titus, and claims 26-28 over Schiele and Flory in view of Titus, and further in view of U.S. Patent 5,304,306 to Gerteis, claims 29, 31, and 32 over Schiele and Flory in view of Titus, and further in view of U.S. Patents 5,304,306 and 5,286,378 to Gerteis, claim 30 over Schiele and Flory in view of Titus, and further in view of U.S. Patent 5,286,378 to Gerteis, claims 33-35 over Schiele and Flory in view of Titus, and U.S. Patent 5,421,997 to Gerteis, claims 36-38, 46 and 47 over Schiele and Flory in view of Titus, and U.S. Patent 6,314,824 to Gerteis, claims 38-40 over Schiele and Flory in view of Titus, and U.S. Patent 6,033,563 to Gerteis, claims 41-43 over Schiele and Flory in view of Titus, and U.S. Patent 5,988,398 to Gerteis, and claims 44 and 45 over Schiele and Flory in view of Titus, and U.S. Patent 6,159,360 to Gerteis.

Claim 1 has been amended to more distinctly define and describe the invention, by including the limitations of dependent claim 2. Claim 2 has been canceled without prejudice. Thus, this response addresses the rejection of claim 2, and the applicants respectfully submit that the basic premise underlying the rejection of claim 2 is flawed. More specifically, Schiele and Flory references are related to completely different technologies than the Titus reference, and contain no motivation to combine these references, even if they could be

combined as proposed in the Office Action. Rather, the combination of these references in such a way as to satisfy the pending claims would only result from improper hindsight.

U.S. Patent 5,021,158 to Schiele describes a clothless invertible filter centrifuge which uses push-bottom 8 which tightly abuts the wall of cake-forming chamber 5 and which is axially displaceable to push the filter cake which accumulated in cake-forming chamber 5 out of the centrifugal drum to prepare the centrifuge for the next charge of suspension to be treated in the centrifuge.

In contrast, the present invention envisions that residue will be left in the drum following the discharge of the solids, and, accordingly, provides "a pneumatic contrivance for detaching and discharging residue of the solids remaining on the filtering medium." As amended, claim 1 specifically requires that "the drum base [have] a diameter only slightly smaller than the inside diameter of the drum at its closed end wall" such that the drum base when moved relative to the cylindrical wall of the drum removes most of the filter cake out of the drum of the centrifuge, but leaves a solid residue behind which is then detached and discharged by the pneumatic contrivance provided according to the present invention. The advantages obtained by the dual removal mechanism of the invention, namely the drum base for removing the majority of the filter cake and the pneumatic contrivance for detaching and discharging solid residues of the filter cake remaining after most of the filter cake has already been removed, is described in some detail in the introductory portion of the present specification.

The sealing member provided at the peripheral surface of the drum base of the invention is just to bear sealingly against the cylindrical wall of the drum adjacent the closed end wall of the drum to avoid suspension during the filtering process leaking into parts of the centrifuge behind or around the centrifugal drum. However, the drum base is, according to amended claim 1, constructed such that the diameter is slightly smaller than the inside diameter of the drum which avoids mechanical contact of the drum base during the relative movement of the drum base and the cylindrical wall of the drum. Therefore a small residue of solid material in the drum will necessarily remain in the drum which is then detached and discharged by the pneumatic contrivance as indicated above.

In sharp contrast, the disclosure of the Schiele reference is complete in and of itself and does not indicate any problems with the way the filter cake is removed from the centrifugal drum. Accordingly, Schiele provides no motivation to one of ordinary skill in the art using the technology of Schiele with a totally different technology, as suggested in Titus.

U.S. Patent 4,163,895 to Titus proposes a completely different mechanism than Schiele for removing the filter cake from the walls of the centrifugal drum. The technology disclosed

in Titus does not use a drum base to mechanically remove the filter cake. Rather, Titus utilizes a pneumatic contrivance only for detaching and discharging solid residues. The drawbacks of such a solution are largely described in the introductory portion of the specification of the present application.

Further, and as with the Schiele reference, the solution provided by Titus is complete in itself and the reference does not indicate that the pneumatic contrivance proposed by Titus would provide less than a complete removal of all solid residues. Titus provides no motivation to include a mechanical device to remove the majority of the filter cake prior to start operation of the pneumatic contrivance, which then would be limited for detaching and discharging solid residues of the filter cake only. Moreover, Titus certainly provides no disclosure from which one of skill in the art would be motivated to select the dimensions of the drum base such that its diameter is only slightly smaller than the inside diameter of the drum, ensuring that the drum edge would not mechanically contact the drum wall during removal of the filter cake from the drum, as claimed in pending independent claim 1.

U.S. Patent 4,808,308 to Flory likewise provides no motivation to make the proposed combination of references or to provide the claimed invention. Flory's disclosure largely parallels to the above-discussed Schiele reference in that Flory requires that the drum base remove all of the filter cake, which is the only means provided to remove solid residues out of the centrifugal drum. Again, the reference teaches a technology which is complete in itself and which does not need any complement structure to operate successfully.

The present invention, in contrast to the teaching of Flory, teaches to discharge the filter cake to a large extent by mechanical means, namely the drum base, whereas the remaining residues are detached and discharged by a pneumatic contrivance. The concept of the present invention therefore is in contrast to the teaching of Flory and Schiele which both actually teach away from the invention by striving to remove the filter cake by the mechanical means only, i.e., by the drum base in its to and fro motion with respect to the cylindrical drum wall. The present invention, however, teaches to construct the drum base or, more generally speaking, the mechanical means for removing the filter cake, such that a small residue remains which then is detached and discharged by a pneumatic contrivance.

It appears therefore that the combination of Flory and/or Schiele with Titus is based on inadmissible hindsight. Amended claim 1, which now includes the limitations of prior dependent claim 2, clearly distinguishes over any of these references and, in addition, over any combination of these references. The same arguments apply to the method claim 48 which depends on claim 1, thus incorporating the amendment made to claim 1. Finally, since all other

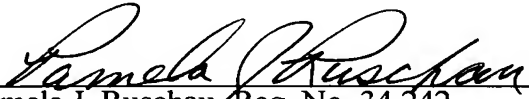
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claims are dependent on claim 1 and claim 48, respectively, it is believed that upon the amendment made to claim 1 all of the application should be in condition for allowance.

Conclusion

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,


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